## Claims

1. An instrument for cleaning and/or shaping and/or widening a channel that exists in or through a solid object;

characterized in that the inner volume enclosed by said instrument, the outer contour of said instrument, or both change during use in order to shape said instrument to the three-dimensional contour of said channel.

2. An instrument according to claim 1, wherein the shape of the perimeter of said instrument adjusts during use to conform to the perimeter of the local cross section of the channel at each radial plane located along the length of said instrument that is inserted into said channel.

3. An instrument according to claim 1, wherein said instrument is made from a superelastic material.

4. An instrument according to claim 1, wherein said instrument is made from material having shape memory properties.

5. An instrument according to claim 4, wherein the material of which said instrument is treated to give it shape memory properties.

6. An instrument according to claim 3, wherein the superelastic material is a nickel titanium alloy.

7. An instrument according to claim 4, wherein the instrument having shape memory properties is made from a nickel titanium alloy.

8. An instrument according to claim 1, wherein a single instrument can be inserted in the channel and used for the entire procedure of cleaning and/or shaping and/or widening said channel before being withdrawn.

9. An instrument according to claim 1, wherein, if said instrument breaks inside the channel, the broken piece of said instrument can be withdrawn from said channel without damaging the solid object.

10. An instrument according to claim 1, wherein the body of said instrument is comprised of one or more longitudinal elements and one or more circumferential elements.

11. An instrument according to claim 10, wherein the longitudinal and circumferential elements have a three-dimensional shape chosen from the group comprising:

- blade shaped;
- polygonal prism shaped;
- rod shaped;
- curved shaped; and
- round shaped.

12. An instrument according to claim 10, wherein the longitudinal and circumferential elements have a cross-sectional shape chosen from the group comprising:
- polygonal;
- round;
- curved; and
- blade-shaped.

13. An instrument according to claim 10, wherein the longitudinal elements have a shape selected from the group comprising:
- straight elements; and
- curved elements.

14. An instrument according to claim 10, wherein the circumferential elements have a shape selected from the group comprising:
- straight elements; and
- curved elements.

15. An instrument according to claim 10, wherein the number of longitudinal elements is at least one and the circumferential elements are distributed along the longitudinal axis of said instrument.

16. An instrument according to claim 10, wherein the longitudinal and circumferential elements define the three-dimensional shape of said instrument, such shape being an empty volume surrounding the longitudinal axis, said volume bounded radially by a wall having an open lattice-like structure.

17. An instrument according to claim 1, wherein at least a part of the outer surface of said instrument is constructed or modified in such a way as to allow said instrument to remove material from the wall of the channel when relative motion takes place between said outer surface and said wall.

18. An instrument according to claim 17, wherein at least part of the outer surface of said instrument is coated with a coating of an abrasive material.

19. An instrument according to claim 18, wherein the abrasive material is chosen from the group comprising:

- diamond powder;
- titanium nitride; and
- tungsten carbide.

20. An instrument according to claim 17, wherein at least part of the outer surface of said instrument is roughened.

21. An instrument according to claim 17, wherein at least part of the outer surface of said instrument comprises numerous small teeth.

22. An instrument according to claim 17, wherein at least part of the outer surface of said instrument comprises a cutting edge.

23. An instrument according to claim 17, wherein the relative motion is chosen from the group comprising:

- rotation;
- translation;
- vibration; and
- a combination of two or more of these motions.

24. An instrument according to claim 1, wherein debris resulting from the cleaning and/or shaping and/or widening can be removed from the channel while said instrument is inserted and working in said channel.

25. An instrument according to claim 24, wherein the debris is removed via the interior of said instrument.

26. An instrument according to claim 24, wherein the debris is removed via the space between the wall of the channel and the outer surface of said instrument.

27. An instrument according to claim 1, wherein fluid can flow into the channel while said instrument is inserted and working in said channel.

28. An instrument according to claim 27, wherein the fluid flows via the interior of said instrument.

29. An instrument according to claim 27, wherein the fluid flows via the space between the wall of the channel and the outer surface of said instrument.

30. An instrument according to claim 1, wherein, during the procedure of cleaning and/or shaping and/or widening the channel, a relatively uniform amount of material is removed from the wall of said channel along the entire insertion length of said instrument in said channel.

31. An instrument according to claim 1, wherein, during the procedure of cleaning and/or shaping and/or widening the channel, a different amount of material is removed from the wall of said channel at different positions along the insertion length of said instrument in said channel

32. An instrument according to claim 1, wherein said instrument is inserted into the channel such that it passes through the entire length of said channel.

33. An instrument according to claim 1, wherein said instrument is inserted into the channel such that it passes through only a portion of the entire length of said channel.

34. An instrument according to claim 1, wherein, after the procedure of cleaning and/or shaping and/or widening the channel, the cross-sectional shape of said channel, along the entire insertion length of

said instrument into said channel, is essentially the same as the cross-sectional shape before said procedure of cleaning and/or shaping and/or widening said channel.

35. An instrument according to claim 1, comprising a long narrow balloon, which is inserted into the channel and then inflated.

36. An instrument according to claim 1, wherein said instrument is an endodontic file, the channel is a root canal, and cleaning and/or shaping and/or widening of the channel comprises the cleaning, shaping, and widening stage of a root canal procedure.

37. A method of using the instrument of claim 1 for cleaning and/or shaping and/or widening a channel that exists in or through a solid object said method comprising the following steps:

- inserting said instrument into said channel;
- causing relative motion between said instrument and the wall of said channel;
- optionally, removing the debris resulting from said cleaning and/or shaping and/or widening from said channel while said relative motion between said instrument and said wall of said channel takes place;

- optionally, causing fluid to flow into said channel while said relative motion between said instrument and said wall of said channel takes place; and
- removing said instrument from said channel when said cleaning and/or shaping and/or widening have been completed.

38. A method of using the endodontic file of claim 36 for cleaning, and/or shaping, and/or widening a root canal, said method comprising the following steps:
- inserting said file into said root canal;
- causing said file to move relative to the wall of said root canal;
- optionally, removing the debris resulting from said cleaning, shaping, and widening from said root canal while said file moves relative to said wall of said root canal;
- optionally, causing fluid to flow into said root canal while said file moves relative to said walls of said root canal; and
- removing said file from said root canal when said cleaning, shaping, and widening have been completed.

39. A method according to claim 37 or claim 38, wherein more than one file is used to clean, and/or shape, and/or widen the channel.